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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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08/18/2000

Je Hong Kim

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05/28/2004

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EXAMINER

DUONG, THOI V

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 05/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicant(s)

09/640,703

Applicant(s)

KIM, JE HONG

Examiner

Thoi V Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-17,19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-17,19,21,24 and 25 is/are rejected.
- 7) ☒ Claim(s) 22 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on March 17, 2004 has been entered.

Accordingly, claim 11 was amended, claims 2, 18 and 20 were cancelled, and new claims 22-25 were added. Currently, claims 1, 3-17, 19 and 21-25 are pending in this application.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 3-5, 7, 9-13, 17, 19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudisill et al. (USPN 5,339,179) in view of Hiyama et al. (USPN 6,104,454).

Re claims 1 and 11, as shown in Figs. 1-3, Rudisill et al. discloses a back light unit for a liquid crystal display, comprising:

a lamp 38 in a lamp housing 40;

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a light-guide plate 36 aside said lamp and said lamp housing, said light-guide plate including cones 48 distributed in a pattern (see Fig. 3, item 56) for guiding uniformly light from the lamp (col. 4, lines 43-47 and col. 6, lines 13-18); and

a reflective plate placed below said light-guide plate (col. 6, lines 4-6 and see also Fig. 5C, item 74),

wherein said cones are formed on an upper surface of said light-guide plate, and a density of cones increases as a distance from said lamp increases (col. 6, lines 13-18); accordingly, *re claim 5*, spacings of cones of the cone pattern is controlled to correspond to a distribution of the light;

wherein, *re claims 3 and 4*, a diameter of a cone of the cone pattern ranges from 250 to 1270 micrometers and a vertical angle of a cone of the cone pattern ranges from 60° to about 150° according to the side wall angle of the cone (col. 6, lines 19-37); accordingly, if the vertical angle and the diameter of the cone are 90° and 400 micrometers respectively, the height of the cone will be 200 micrometers; and

wherein, *re claims 19 and 21*, a density of said cones are such that light exiting from said light-guide plate is uniformly distributed (col. 6, lines 13-18); accordingly, said cones are more densely populated around partially dark areas of said light-guide plate since the partially dark areas are the areas further away from the lamp.

Rudicill et al. discloses a backlight unit for a liquid crystal display that is basically the same as that recited in claims 1, 3-5, 11, 19 and 21 except for a light-path converter and a diffusion sheet disposed above said light-guide plate.

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As shown in Fig. 1, Hiyama et al. discloses a backlight unit for a liquid crystal display comprising:

a light-path converter 50 to control a progress direction of the light in such a manner that the light outputted from the light-guide plate is progressed in a direction perpendicular to a liquid crystal panel (col. 5, lines 23-35); and

a diffusion sheet 60 disposed above said light-path converter for diffusing the light passing through the light-path converter into the liquid crystal panel (col. 4, lines 50-62),

wherein, *re claims 7 and 13*, the light-path converter is a backward prism sheet having a desired between angle (col. 5, lines 36-39);

wherein, *re claims 9 and 10*, the light-path converter is a hologram sheet 70 as shown in Figs. 4, 8A, 8B, 9A and 9B, wherein a space and a shape of the hologram pattern are controlled to correspond to an output angle of the light progressing into the liquid crystal panel (col. 6, lines 49-67); and

wherein, *re claim 12*, the light-path converter is placed above the light-guide plate 30.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the backlight unit for a liquid crystal display of Rudicill et al. with the teaching of Hiyama et al. by forming a light-path converter and a diffuser to obtain a backlight device having high brightness and high uniformity (col. 1, lines 64-65).

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4. Claims 6 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudisill et al. (USPN 5,339,179) in view of Hiyama et al. (USPN 6,104,454) as applied to claims 1, 3-5, 7, 9-13, 17, 19 and 21 above and further in view of Ohara et al. (USPN 5,844,720).

The back light unit of Rudicill et al. as modified in view of Hiyama et al. above includes all that is recited in claims 6 and 14 except that the light-path converter is not a forward prism sheet having a vertical angle ranging from about 90° to 130°.

As shown in Figs. 1 and 2, Ohara et al. discloses a back light unit 50 for a liquid crystal display comprising a forward prism sheet disposed on top of a light-guide plate 6 and having a vertical angle ranging from 70° to 110° (col. 3, lines 27-48) for improvement in display brightness (col. 3, lines 28-30).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the back light unit of Rudicill et al. with the teaching of Ohara et al. by employing a forward prism sheet having a proper vertical angle to improve the display brightness (col. 3, lines 28-30).

5. Claims 8, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudisill et al. (USPN 5,339,179) in view of in view of Hiyama et al. (USPN 6,104,454) as applied to claims 1, 3-5, 7, 9-13, 17, 19 and 21 above and further in view of Yokoyama et al. (USPN 5,899,552).

The back light unit of Rudicill et al. as modified in view of Hiyama et al. above includes all that is recited in claims 8, 15 and 16 except that the vertical angle of the backward prism is not above about 100°.

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As shown in Fig. 19, Yokoyama et al. discloses a back light unit BL for producing a uniform and bright illuminating light (col. 4, lines 64-67), comprising a backward prism 7 placed above a light-guide plate 61, wherein the prism has a vertical angle from 80° to 120° (col. 32, lines 51-55 and col. 35, lines 23-58). Accordingly, a desired between angle of the backward prism sheet is well within 45°.

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the back light unit of Rudicill et al. with the teaching of Yokoyama et al. by employing a backward prism as a light-path converter having a vertical angle of above about 100° so as to obtain a bright and uniform display image (col. 5, lines 49-55).

6. Claims 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rudisill et al. (USPN 5,339,179) in view of Hiyama et al. (USPN 6,104,454) as applied to claims 1, 3-5, 7, 9-13, 17, 19 and 21 above and further in view of Miyashita et al. (USPN 6,011,602).

The back light unit of Rudicill et al. as modified in view of Hiyama et al. above includes all that is recited in claims 24 and 25 except for an output angle of light exiting from the light-guide plate being about 35°.

As shown in Fig. 6, Miyashita et al. discloses that an output angle of light 16 exiting from the light-guide plate 70 is more than 30° to obtain an improved display intensity (col. 13, lines 59-65).

Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the back light unit of Rudicill et al. with

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the teaching of Miyashita et al. such that a desired output angle of light exiting from the light-guide plate can be obtained to improve light intensity (col. 13, lines 64-65).

Allowable Subject Matter

7. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: none of the prior art of record fairly suggests or shows all of the limitations as claimed. Specifically,

Re claims 22 and 23, none of the prior art of record discloses, in combination with other limitations as claimed, the cones are more densely packed in the partially dark areas (of the light-guide plate) caused by rubber packing of the lamp.

The most relevant references, USPN 5,339,179 of Rudicill et al. and USPN 5,961,197 of Watai et al., fail to disclose or suggest the cones densely packed in the partially dark area on the light-guide plate. The Rudicill's reference only discloses varying the areal density of pits on the top surface of the light-guide plate as a function of the distance from the edge light. Meanwhile, Watai et al. shows in Fig. 1 that the dark area X on the light-guide plate is caused by two end 6a and 6b of the lamp 6, and as shown in Fig. 8, Watai et al. discloses a matte surface formed on an incidence end surface 11 of the light-guide plate 10 and having roughness that increases toward end portions thereof to avoid variation in luminance occurring near the incidence end surface.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments


8. Applicant's arguments filed March 17, 2004 have been fully considered but they are not persuasive. Applicant argued that Rudicill et al. fails to motivate one of ordinary skill to produce a uniform light distribution on the light-guide plate. The Examiner disagrees with Applicant's remarks since Rudicill et al. in fact discloses a light-guide plate including pits (cones) distributed in a pattern such that a density of pits increases as a distance from the lamp increases for guiding uniformly light from the lamp as recited in independent claims 1 and 11 (col. 4, lines 43-47 and col. 6, lines 13-18). Thus a *prima facie* case of obviousness has been made.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (571) 272-2292. The examiner can normally be reached on Monday-Friday from 8:30 am to 4:30 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (571) 272-2293.

Thoi Duong 

05/25/2004


DUNG T. NGUYEN
PRIMARY EXAMINER